

Appl. No. : 09/830,820
Filed : April 27, 2001

IN THE CLAIMS:

Claims 1-9 (Canceled)

Please cancel Claims 21 and 31.

21
10. (Previously Presented) A hybrid powered vehicle comprising a vehicle body, a propulsion unit configured to propel the vehicle body, a battery unit configured to supply sufficient power to the propulsion unit to propel the vehicle body, the battery unit comprising a battery configured to store electric power, a battery unit controller, a battery unit sensor configured to detect at least one operational characteristic of the battery and emit a signal including battery data indicative of the operational characteristic of the battery, and a battery unit memory configured to store the battery data, the battery unit being formed as integral unit, a fuel cell unit configured to supply sufficient power to the propulsion unit to propel the vehicle body, the fuel cell unit comprising a fuel cell configured to generate electrical power from a flow of fuel therethrough, a fuel cell unit controller, a fuel cell unit sensor configured to detect at least one operational characteristic of the fuel cell and emit a signal including fuel cell data indicative of the operational characteristic of the fuel cell, and a fuel cell unit memory configured to store the fuel cell data, the fuel cell unit being configured as an integral unit, and a main controller configured to selectively supply power from the battery unit and the fuel cell unit to the propulsion unit.

11. (Original) The vehicle according to Claim 10 additionally comprising a first bidirectional data connection between the main controller and the battery unit controller and a second bidirectional data connection between main controller in the fuel cell unit controller.

12. (Original) The vehicle according to Claim 10, wherein at least one of the fuel cell unit and the battery unit is removable from the vehicle as an integrated unit.

13. (Original) The vehicle according to Claim 10, wherein the battery unit controller is configured to determine an amount of electrical power in the battery, the fuel cell unit controller being configured to determine an amount of electrical power available from the fuel cell, the main controller being configured to emit a warning signal if the amount of electrical power available from at least one of the battery unit and the fuel cell unit is below a predetermined amount.

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14. (Original) The vehicle according to Claim 10 additionally comprising a battery unit switch selectively connecting the battery unit with the main controller and a fuel cell unit switch selectively connecting the fuel cell unit with the controller, the main controller being configured to detect an abnormality in the battery unit and the fuel cell unit, and to operate at least one of the switches if an abnormality is detected in one of the battery unit and the fuel cell unit.

91 15. (Withdrawn) A hybrid power system comprising first and second power supply units, a main switch for switching on the first and second power units, and a main controller configured to control the power units, wherein each of the first and second power units are formed as an integral unit, respectively, each unit including a power supply device, a unit controller, at least one sensor configured to detect a state of the unit, and a memory portion configured to store data indicative of the state detected by the sensor.

16. (Withdrawn) The power system according to Claim 15, wherein each of the first and second power supply units are configured to be removable as a unit from a vehicle.

17. (Withdrawn) The power system according to Claim 15, wherein the first power supply unit is a battery unit and the second power supply unit is a fuel cell unit.

18. (Withdrawn) The power system according to Claim 15, wherein the first power supply unit is a fuel cell unit comprising a reformat fuel reservoir, a fuel reformer configured to reform reformat fuel from the reformat fuel reservoir into a reformed fuel, and a fuel cell configured to generate electrical power from the reformed fuel.

19. (Withdrawn) The power system according to Claim 15, wherein the main controller is configured to perform bidirectional data communication with the unit controllers.

20. (Withdrawn) The power system as set forth in Claim 15, wherein at least the main controller is configured to, after a predetermined time has elapsed from a time when the main switch is turned off, perform preparation processing on at least one of the first and said second power supply sources in preparation for the main switch being turned on.

21. (Canceled)

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22. (Currently Amended) A hybrid-powered vehicle comprising a vehicle body, a propulsion device configured to propel the vehicle body, first and second power supply sources being different from each other, each power supply source being configured to supply sufficient power to drive the propulsion device, a controller configured to determine an amount of power available from each of the first and second power supply sources, the controller being configured to calculate an approximate travel range of the vehicle based on the amount of power available from the first and second power supply sources. ~~The vehicle as set forth in Claim 21,~~ wherein the first power source is a fuel cell and the second power source is a battery, the controller being configured to determine a fuel consumption ratio of the fuel cell and a capacity consumption ratio of the battery, the controller also being configured to determine the approximate travel range based on the fuel consumption ratio and the capacity consumption ratio.

23. (Original) The vehicle as set forth in Claim 22, wherein the controller is configured to emit a warning if the approximate travel range is not more than a predetermined travel range.

24. (Original) The vehicle as set forth in Claim 22 additionally comprising a memory including data regarding capacity of the battery corresponding to a current and a voltage of the battery, the controller being configured to calculate battery capacity based on the data and at least one of the current and voltage of the battery.

25. (Original) The vehicle as set forth in Claim 24, wherein the controller is configured to obtain a first detection data regarding at least one of current and voltage of the battery and a second detection data regarding at least one of current and voltage of the battery after a predetermined time period has elapsed from when the first detection data was obtained.

26. (Original) The vehicle as set forth in Claim 25, wherein the controller is configured to determine an impedance of the battery from the calculated capacity value based on the first and the second detection data.

27. (Withdrawn) A hybrid-powered device having a power system including first and a second power supply sources for driving the device, the first and second power supply sources being connected to said power system through at least first and second switches, respectively, and a device controller for controlling the power system, the first

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and second power supply sources having first and second controllers, respectively, the first and second controllers being configured to detect at least one abnormality in the respective power supply source and to store detection data regarding the abnormality, the device controller being configured to operate a corresponding one of the switches when the abnormality is detected by at least one of the first and second controllers.

28. (Withdrawn) The device according to Claim 27, wherein the controller is configured to perform bidirectional communication with the first and second controllers so as to send and receive data.

29. (Withdrawn) The device according to Claim 27, wherein each of the first and second controllers are configured to send a request signal to the device controller for requesting that a discharging of a corresponding power supply source cease upon a detection of an abnormality in the corresponding power supply source.

30. (Withdrawn) The device according to Claim 29, wherein the device controller is configured to operate the switches in response to a request signal from at least one of the first and second controllers.

31. (Canceled)

32. (Currently Amended) A hybrid-powered vehicle comprising a vehicle body, a propulsion device configured to propel the vehicle body, first and a second power supply sources being different from each other, each power supply source being configured to supply sufficient power to drive the propulsion device, a controller configured to determine an amount of power available from each of the first and second power supply sources, the controller including means for calculating an approximate travel range of the vehicle based on the amount of power available from the first and second power supply sources, The vehicle as set forth in Claim 31, wherein the first power source is a fuel cell and the second power source is a battery, the means for calculating including means for determining a fuel consumption ratio of the fuel cell and a capacity consumption ratio of the battery, the means for calculating including means for determining the approximate travel range based on the fuel consumption ratio and the capacity consumption ratio.

33. (Original) The vehicle as set forth in Claim 32, wherein the controller includes means for emitting a warning if the approximate travel range is not more than a predetermined travel range.

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34. (Original) The vehicle as set forth in Claim 32 additionally comprising a memory including data regarding capacity of the battery corresponding to a current and a voltage of the battery, the controller being configured to calculate battery capacity based on the data and at least one of the current and voltage of the battery.

35. (Original) The vehicle as set forth in Claim 34, wherein the controller includes means for obtaining first and second detection data regarding at least one of current and voltage of the battery with a predetermined time period delay between obtaining the first and second detection data.

36. (Original) The vehicle as set forth in Claim 35, wherein the controller includes means for determining an impedance of the battery from the calculated capacity value based on the first and the second detection data.

37. (Withdrawn) A hybrid-powered device having a power system including first and a second power supply sources for driving the device, the first and second power supply sources being connected to said power system through at least first and second switches, respectively, and a device controller for controlling the power system, the first and second power supply sources having first and second controllers, respectively, the first and second controllers including means for detecting at least one abnormality in the respective power supply source and for storing detection data regarding the abnormality, the device controller being configured to operate a corresponding one of the switches when the abnormality is detected by at least one of the first and second controllers.

38. (Withdrawn) The device according to Claim 37, wherein the controller includes means for performing bidirectional communication with the first and second controllers so as to send and receive data.

39. (Withdrawn) The device according to Claim 37, wherein each of the first and second controllers include means for sending a request signal to the device controller for requesting that a discharging of a corresponding power supply source cease upon a detection of an abnormality in the corresponding power supply source.

40. (Withdrawn) The device according to Claim 39, wherein the device controller is configured to operate the switches in response to a request signal from at least one of the first and second controllers.